

## Study on Crop Losses due to COVID-19 Lockdown Period in Nagaon district of Assam

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### ABSTRACT

An online survey was performed among the different categories of farm households in Nagaon district, Assam. Out of 300 cropped based agricultural farm households, 151 nos. of farmers were selected randomly and were grouped in accordance to their operational holdings viz. marginal (<1 ha), Small (1.01 to 2 ha), Medium (2.01 to 4 ha) and large (>4.01 ha). The necessary information was collected through their WhatsApp's, messages and telephonic conversation from different 43 revenue villages. With a view to estimate the loss of crops cultivated during Lockdown Period (24<sup>th</sup> March, 2020 to 18<sup>th</sup> April, 2020) due to COVID 19 and determines the loss percentage of different crop enterprises for each group of farmers with district as a whole. After analyzing the received information, it was found that large farms suffered maximum (71.69%) due to small tea garden and betel vine and medium farms incurred loss of about 61.33%. the overall loss of crops was 68.96% . The loss was found to be chiefly due to acute shortage of field labourers following COVID 19 restrictions during Lock Down period 1. As a result of which plucking, harvesting, marketing etc. all are at halt.

### KEYWORDS

WhatsApp, operational holdings, Covid-19

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### INTRODUCTION

The world has passed through many global pandemics from time immemorial. The Covid-19 one of the global pandemics is not a new urgency for humankind, which has abruptly brought significant impacts on public health and the global economy (Thapa *et al*, 2020). Nevertheless, as per WHO (2020) has officially declared outburst of Covid-19 as a global pandemic (Vanelli and M, 2020). The pandemic was escalating very rapidly worldwide because of which protection measure cost for humans was inflecting and as a result, the world's economic activities were suspended (Singh *et al*, 2020). According to the IMF (2020), it has been estimated that the global economy is projected to reduce sharply by -3 percent in 2020, which is much worse than 2008-2009. It has been also assumed that there will be a rise in the global economy by 2021 by 5.6 percent as all the activities will normalize assisted by policy makers.

The official announcement of COVID-19 as a global pandemic on March 11, 2020 by WHO, the world economy has abruptly declined, billions of people were in lockdown, maintaining self-isolation. The lockdown to curb the spread of Covid-19 has severely hampered India's agricultural sector, which currently contributes 16-17% of the GDP. India hosts nearly one fourth of the world's farmers and possess 48% of world's arable land. The country has made significant advances in many off-farm sectors such as service sector, industrial production etc. but agriculture continues to be the lifeline of the

nation, especially for the 64% Indians living in rural areas. More than half the farmers who harvested their crops suffered a lower yield during the nationwide lockdown, compared to the last season of sowing the same crop, revealed a survey of 1,500 farmers in 200 districts across 12 states.

**Table 1:** The Breakup of the Farm size

Farm size	No of farmers	Average area per farm (ha)
Marginal	63	0.51
Small	54	1.34
Medium	23	2.31
Large	11	1.01
Total	151	2.05

The lockdown to curb the spread of the novel coronavirus disease (COVID-19) also forced 55 per cent of the farmers to store their crops as they were unable to sell them. The survey aimed to evaluate the impact of the lockdown on agricultural production and livelihood was conducted by the Harvard TH Chan School of Public Health, Public Health Foundation of India and Centre for Sustainable Agriculture from May 3 to May 15, 2020. Losses for 40 per cent of the farmers who experienced a yield loss, occurred from a lack of labour, storage or transport options, said the survey. Weather was also cited

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**Table 2:** Crop loss Assessment during Lockdown period 1 for Marginal farms in Nagaon District (Nos. of Farmer=63)

crops	No. of farmers	Area (ha)	Total Production (q)	Family consumption (q)	Marketable surplus (q)	Marketed surplus (q)	Market Price (Rs/q)	Value of Marketable Surplus (Rs)	Value of Marketed surplus (Rs)	Loss (Rs)	% Loss
Tomato	18	1.52	213	11.00	202.00	21.00	1000	202000	21000	181000	89.60
Chilli	21	0.42	6	0.05	5.95	1.50	2000	11900	3000	8900	74.79
okra	9	0.35	13	0.06	12.94	4.00	2000	25880	8000	17880	69.08
capsicum	15	0.60	10	0.05	9.95	3.10	3000	29850	9300	20550	68.84
Brinjal	12	0.98	39	2.00	37.00	15.00	1000	37000	15000	22000	59.45
Bottle gourd	9	0.63	22	1.50	20.50	5.50	1500	30750	8250	22500	73.17
Cabbage	25	1.75	147	7.00	140.00	75.00	1000	140000	75000	65000	46.42
Cauliflower	25	1.75	92	5.00	87.00	36.00	1800	156600	64800	91800	58.62
	134	8.00						633980	204350	429630	

Total % of Loss= (Total loss/Value of Marketable Surplus) = 633980/429630x100 = 67.76%

as a reason for the loss in yield by 80 per cent of the farmers. Around 30 per cent of them were unable to harvest their crops because of issues related to the lockdown, said the survey. Out of the 63 per cent farmers who could harvest their crops, 22 per cent had to store their crop due to lockdown related issues. Around 12 per cent farmers were still trying to sell their crop, while 44 per cent farmers managed to sell their produce. A study was undertaken by Regional Agricultural Research Station, AAU, Shillongani, Nagaon to estimate the

loss of crops cultivated during Lockdown Period 1 in different categories of farmers in the district as well as evaluate the loss percentage of different crops for each group of farmers and district as a whole.

**MATERIALS AND METHODS**

The study was based on farm level information pertaining to the Lockdown Period 1(23<sup>rd</sup> March, 2020 to 20<sup>th</sup> April, 2020) in Nagaon district. Out of the total villages of 1412,

**Table 3:** Crop loss Assessment during Lockdown period 1 for Small farms in Nagaon District (Nos. of Farmer =54)

Crops	No. of farmers	Area (ha)	Total Production (q)	Family consumption (q)	Marketable surplus (q)	Marketed surplus (q)	Market Price (Rs/q)	Value of Marketable Surplus (Rs)	Value of Marketed surplus (Rs)	Loss (Rs)	% Loss
Tomato	20	3.60	63	3.15	59.85	5.98	1000	59850	5980	53870	90.00
Chilli	16	2.56	15	0.75	14.25	2.34	2000	29500	4680	24820	84.13
okra	27	2.97	40	8.00	32.00	8.00	2000	64000	16000	48000	75.00
capsicum	18	1.62	18	0.36	17.64	3.50	3000	52920	10500	42420	80.15
Brinjal	30	7.80	46	1.92	44.08	5.65	1000	44080	5650	38430	87.18
Bottle gourd	30	3.90	44	2.20	41.80	21.64	1500	62700	32460	30240	48.30
Cabbage	35	4.55	70	7.00	63.00	15.50	1000	63000	15500	47500	75.39
Cauliflower	35	4.55	53	2.65	50.35	15.68	1800	90630	28224	62406	68.85
Pointed gourd	10	1.30	12	0.25	11.75	2.25	1200	14100	2700	11400	80.85
	221	32.85			480780	359066					

Total % of Loss = (Total loss/Value of Marketable Surplus) = 359066/480780x100 = 74.68 %

**Table 4: Crop loss Assessment during Lockdown period 1 for Medium farms in Nagaon District (Nos. of Farmer =23)**

crops	No. of farm-ers	Area (ha)	Total Produc-tion (q)	Family consump-tion (q)	Mar-ketable surplus (q)	Mar-keted surplus (q)	Market Price (Rs/q)	Value of Marketable Surplus (Rs)	Value of Marketed surplus (Rs)	Loss (Rs)	% Loss
Tomato	5	0.18	65.00	3.20	61.80	12.36	1000	61800	12360	49440	80.00
Pump-kin	5	0.18	12.00	1.54	10.46	9.41	1000	10460	9410	1050	10.03
Chilli	11	0.13	15.60	1.69	13.91	2.39	2000	27820	4780	23040	82.81
Cucum-ber	8	0.39	20.35	4.23	24.58	8.85	1000	24580	8850	15730	63.99
Brin-jal	16	0.26	70.00	3.51	66.49	23.40	1000	66490	23400	43090	64.80
Bitter gourd	7	0.13	46.00	2.10	43.90	19.75	3000	131700	59250	72450	55.01
Bot-tle gourd	12	0.13	47.00	7.00	40.00	25.50	1500	60000	38250	21750	36.25
Cab-bage	13	0.26	90.00	9.78	80.22	23.64	1000	80220	23640	56580	70.53
Cauliflower	11	0.26	55.00	4.13	50.87	21.76	1800	91566	39168	52398	57.22
Black gram	6	0.65	1.67	0	1.67	1.67	5000	8350	8350	0	0
Water melon	8	0.13	96.00	6.58	89.42	26.45	1200	107304	31740	75564	70.42
Total	101	2.70						670290		411092	

the list of the farmers was prepared by collecting the respective mobile phone nos., whatsapp nos., from different 43 revenue villages. The selected villages were linked either with APART (Assam Agribusiness and Transformation Project) or FLD (Front Line Demonstration) of different AICRP of Regional Agricultural Research Station, Assam Agricultural University, Shillongani, Nagaon, Assam. Phone nos. were listed village wise, all total 300 cropped based agricultural farmers. By randomizing a sample of 151 nos. farmers were selected. During the lock down period 1, crops in the cultivated field, total cultivable area, and present cropped area etc. relevant quarry were asked through telephone or they were able to communicate in whatsapp. The questionnaire were posted to the listed farmers in their respective mobiles and they were asked to answer with relevant information regarding total operational holdings, respective crops available during lockdown period, expected production and loss at that period. Farmers were directed to enlist the amount consume for family purposed, the quantity of produce actually sold and return received. After receiving the information, farmers were grouped according to their operational holdings viz. Marginal (>1 ha), Small (1.01 to 2.0 ha), Medium (2.01 to 4.0ha) and Large (<4.01ha) in table 1 and depicted in fig 1. Data were analyzed in accordance to group size and overall to dis-

trict. The information was categorized to marketed surplus after deducting family consumption and marketable surplus. The values of marketable and marketed surplus were calculated by multiplying with crop market price. Present production of cultivated crops of the farmers during the COVID 19 period were only considered. It means losses Respective losses were determined by deducting marketed surplus from marketable surplus. Total percentage of loss was calculated as Total Loss/Value of Marketable surplus  $\times$  100.

**Limitation of the study:** The study is subject to the following limitations

1. The study is restricted to the Nagaon district only.
2. Time and communication are the factors, which have limited the size of the sample.

## RESULTS AND DISCUSSIONS

### Marginal Farm

howed the crops grown and loss incurred by the marginal farms. Out of the total 8 number of crops available in the farmers' field tomato was found to incur the highest loss (89.60%) of the production during this period, as it is the most perishable and risky crop. Another crop, chilli recorded the second highest loser (74.79) grown by 21 respondents. Cole crops as Cabbage and cauliflower recorded 46.42 and 58.62 % loss in the lockdown period 1 and maximum farmers (25 each) culti-

**Table 5: Crop loss Assessment during Lockdown period 1 for Large farms in Nagaon District** (Nos. of Farmer assessed =11)

crops	No. of farm-ers	Area (ha)	Total Produc-tion (q)	Family consump-tion (q)	Mar-ketable surplus (q)	Mar-keted surplus (q)	Market Price (Rs/q)	Value of Marketable Surplus (Rs)	Value of Marketed surplus (Rs)	Loss (Rs)	% Loss
Tomato	4	2.08	84.00	4.20	79.80	16.00	1000	79800	16000	63800	79.94
Pump-kin	4	2.08	14.00	1.40	12.60	12.00	1000	12600	12000	600	4.75
Brin-jal	8	3.12	40.00	2.00	38.00	8.60	1000	38000	8600	29400	77.36
Bot-tle gourd	5	0.65	23.00	2.60	20.40	7.50	1500	30600	11250	19350	63.23
Ridge gourd	6	0.78	18.00	1.25	16.75	9.95	3000	50250	29850	20400	68.34
Cab-bage	9	3.51	150.00	1.80	148.20	36.75	1000	148200	36750	111450	75.20
Cauliflower	4	3.90	140.00	3.20	136.80	56.85	1800	246240	102330	143910	58.44
Black gram	3	3.00	9.00	0	9.00	9.00	5000	45000	45000	0	0
Squash	4	0.64	22.00	0.80	21.20	9.65	1000	21200	9650	11550	54.48
Water-melon	6	1.56	110.00	3.00	107.00	23.46	1200	128400	28152	100248	78.07
Straw-berry	2	0.26	15.00	0.60	14.40	2.50	6000	86400	15000	71400	82.63
Banana	7	3.50	11.50	1.45	10.05	4.62	2000	20100	9240	10860	54.02
Betel vine	3	0.15	120000 nos.	300 nos	110700	1530	8/20no	44280	612	43668	98.61
Tea	2	1.37	1.30	0	1.30	0	1500	195000	0	195000	100.00
Total	73	26.60						1146070		821636	73

vated these crops out of 63 farmers assessed. The overall loss of marketable surplus was 67.76 % for the marginal farm.

#### Small farm

The findings were depicted in Table No. 3. It showed that crop cultivation, return and loss for the respondent small farmers. The respondent farmers cultivated 9 different rabi vegetables. Out of the total crops tomato recorded heavy loss (90.00 %) during the lockdown period 1 followed by Brinjal (87.18 %) of cropped area 7.80 ha. Most of the crop losses were

Total % of Loss= (Total loss/Value of Marketable Surplus) = $377092/670290 \times 100 = 61.33\%$

#### Large farm

The information was collected from 11 farmers of the study area. Those farmers cultivated not only rabi crops, some perennial crops like Banana, Betel vine and Tea cultivation also practiced (Table 5). In case of tea cultivation, the loss was 100 % during the period. At that time plucking of tea leave

more than 50 % of the marketable surplus. The total loss for small farmers also raised to 74.68 %. **Medium farm**

Total number of farmers assessed was 23. They have grown 11 different crops with an area of 2.70 ha. These were shown in Table No. 4. From the table it was clear that crop chilli recorded the highest loss (82.81 %) followed by tomato (80.00 %). As 6 farmers cultivated Black gram (Pulse) and harvested later so there was no loss. Some other crop like pumpkin as cultivated might be stored for which loss was minimum (10.03%).

was blocked and the effect of growth was stressed. Likewise, pumpkin had also less loss (4.70 %) as mentioned for medium farm. Total percent loss for large farm was found to be 71.69%. Total % of Loss= (Total loss/Value of Marketable Surplus) = $821636/1146070 \times 100 = 71.69\%$

#### District as a whole

A total of 151 farmers were communicated and data supplied were analyzed, shown in table No. 6. All total 19 different

**Table 6: Crop loss Assessment during Lockdown period 1 in Nagaon District** Nos. of Farmer assessed =151

crops	Value of Marketable Surplus (Rs.)					Loss (Rs.)					% Loss
	Marginal	Small	Medium	Large	Total	Marginal	Small	Medium	Large	Total	
Tomato	202000	59850	61800	79800	403450	181000	53870	49440	63800	348110	86.28
Chilli	11900	29500	27820		69220	8900	24820	23040		56760	81.99
Okra	25880	64000			89880	17880	48000			65880	73.29
Capsicum	29850	52920			82770	20550	42420			62970	76.07
Brinjal	37000	44080	66490	38000	185570	22000	38430	43090	29400	132920	71.62
Bottle gourd	30750	62700	60000	30600	184050	22500	30240	21750	19350	93840	50.98
Ridge gourd				50250	50250				20400	20400	68.34
Cabbage	140000	63000	80220	148200	431420	65000	47500	56580	111450	280530	65.02
Cauliflower	156600	90630	91566	246240	585036	91800	62406	52398	143910	350514	59.91
Pointed gourd		14100			14100		11400			11400	80.85
Pumpkin			10460	12600	23060			1050	600	1650	7.15
Cucumber			24580		24580			15730		15730	63.99
Squash				21200	21200				11550	11550	54.48
Watermelon			107304	128400	235704			75564	100248	175812	74.59
Banana				20100	20100				10860	10860	54.02
Bitter gourd			131700		131700			72450		72450	55.01
Black gram			8350	45000	53350			00	00	00	00
Betel vine				44280	44280				43668	43668	98.61
Strawberry				86400	86400				71400	71400	82.63
Tea				195000	195000				195000	195000	100.00
Total	633980	480780	670290	1146070	2931120	429630	359086	411092	821636	2021444	

crops were cultivated during the period. Perennial crops such as Betel vine and tea losses were 100 percent. In case of other crops tomato and pointed gourd recorded losses 86.28 and 80.85 % respectively. So far vegetables were recorded losses were around 50.00 %. The total percentage loss for the district was found to be 68.96.

Total % of Loss= (Total loss/Value of Marketable Surplus) = 2021444/2931120x100 = **68.96 %**

## CONCLUSION

The COVID 19 pandemic has affected the employment, worker migration as well the economic condition worldwide. The farmers, daily workers are mostly suffered, their working and productive force become negligible. Some subsistent farmers leave the agricultural activities and other farmers cultivated crops were unable to harvest their produce, whatever

they harvested not able to market properly. Total loss of percentage, therefore, during the Lockdown Period 1 obtained to be 68.96 % in the district as a whole. In case of cash crop tea suffered 100 % and affected later on. Tomato, a highly perishable vegetable loss percentage was the highest among vegetables during that period. It is the responsibility of both state and central governments to come forward with helping hand to compensate the loss to a possible extent. Government may go for installing mini units of processing structure for pulse, rice, oilseeds etc. in different localities, developing infrastructure of commercial and tertiary sectors so far crop production is concerned.

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